CLAIMS

What is claimed is:

1. A method of determining a multilayer switching path for a flow between a source device and a destination device in a switched network, the method comprising the computer-implemented steps of:

determining a Layer 3 path and a Layer 2 path through the network from the source device to the destination device;

selecting each route processor of the network that is in the Layer 3 path and that appears on a Layer 2 path that is associated with the source device and the destination device and that leads to and emanates from the route processor;

selecting, for each selected route processor, a switch in the network that satisfies a pre-determined set of criteria as a relevant switch engine that multilayer switches the selected route processor;

creating and storing information that defines a multilayer switching path and that includes information identifying the source device, destination device, and each selected switch.

2. A method as recited in Claim 1, wherein selecting the switch that satisfies the pre-determined set of criteria comprises identifying one or more switches in the network that are configured as switch engines, associated with the selected route processor, and included in Layer 2 paths leading to and emanating from the selected route processor.

3. A method as recited in Claim 2, wherein selecting the switch that satisfies the pre-determined set of criteria as the relevant switch engine further comprises selecting from the set of switches as the relevant switch engine the switch that contains an MLS-entry that matches the flow between the source device and the destination device when there is only one switch that contains the MLS-entry that matches the flow.

4. A method as recited in Claim 3, wherein selecting the switch that satisfies the pre-determined set of criteria as the relevant switch engine further comprises selecting from the set of switches as the relevant switch engine the switch that contains an MLS-entry that matches the flow between the source device and the destination device and that is the farthest away on the Layer 2 path from the selected route processor when there is more than one switch that contains the MLS-entry that matches the flow.

5. A method as recited in Claim 2, further comprising establishing a flow between the source device and the destination device when no flow exists between the source device and destination device during determination of the multilayer switching path.

6. A method as recited in Claim 5, wherein establishing the flow between the source device and the destination device further comprises sending packets from the source device to the destination device when the source device is not remote.

7. A method as recited in Claim 5, wherein establishing the flow between the source device and the destination device further comprises sending packets from a network management station when the source device is remote, and such that packets that are sent from the network management station traverse the relevant switch engine for the selected route processor.

8. A method as recited in Claim 5, wherein establishing the flow between the source device and the destination device further comprises sending packets from any route processor that is upstream from the selected route processor to the destination device when the source device is remote.

9. A method as recited in Claim 5, wherein establishing the flow between the source device and the destination device further comprises sending packets from any route processor that is upstream from the selected route processor to the destination device when the source device is remote and when the packets that are sent from a network management station do not traverse the relevant switch engine for the selected route processor.

10. A computer-readable medium comprising one or more sequences of instructions for determining a multilayer switching path for a flow between a source device and a destination device in a switched network, which instructions, when executed by one or more processors, cause the one or more processors to carry out the steps of:

determining a Layer 3 path and a Layer 2 path through the network from the source device to the destination device;

selecting each route processor of the network that is in the Layer 3 path and that appears on a Layer 2 path that is associated with the source device and the destination device and that leads to and emanates from the route processor;

selecting, for each selected route processor, a switch in the network that satisfies a pre-determined set of criteria as a relevant switch engine that multilayer switches the selected route processor;

creating and storing information that defines a multilayer switching path and that includes information identifying the source device, destination device, and each selected switch.

11. A computer-readable medium as recited in Claim 10, wherein selecting the switch that satisfies the pre-determined set of criteria comprises identifying one or more switches in the network that are configured as switch engines, associated with the selected route processor, and included in Layer 2 paths leading to and emanating from the selected route processor.

12. A computer-readable medium as recited in Claim 11, wherein selecting the switch that satisfies the pre-determined set of criteria as the relevant switch engine further comprises selecting from the set of switches as the relevant switch engine the switch that contains an MLS-entry that matches the flow between the source device and the destination device when there is only one switch that contains the MLS-entry that matches the flow.

13. A computer-readable medium as recited in Claim 12, wherein selecting the switch that satisfies the pre-determined set of criteria as the relevant switch engine further comprises selecting from the set of switches as the relevant switch engine the switch that contains an MLS-entry that matches the flow between the source device and the destination device and that is the farthest away on the Layer 2 path from the selected route processor when there is more than one switch that contains the MLS-entry that matches the flow.

14. A computer-readable medium as recited in Claim 11, further comprising establishing a flow between the source device and the destination device when no flow exists between the source device and destination device during determination of the multilayer switching path.

15. A computer-readable medium as recited in Claim 14, wherein establishing the flow between the source device and the destination device further comprises sending packets from the source device to the destination device when the source device is not remote.

16. A computer-readable medium as recited in Claim 14, wherein establishing the flow between the source device and the destination device further comprises sending packets from a network management station when the source device is remote, and such that packets that are sent from the network management station traverse the relevant switch engine for the selected route processor.

17. A computer-readable medium as recited in Claim 14, wherein establishing the flow between the source device and the destination device further comprises sending packets from any route processor that is upstream from the selected route processor to the destination device when the source device is remote.

18. A computer-readable medium as recited in Claim 14, wherein establishing the flow between the source device and the destination device further comprises sending packets from any route processor that is upstream from the selected route processor to the destination device when the source device is remote and when the packets that are sent from a network management station do not traverse the relevant switch engine for the selected route processor.

19. An apparatus for determining a multilayer switching path for a flow between a source device and a destination device in a switched network, the apparatus comprising:

means for determining a Layer 3 path and a Layer 2 path through the network from the source device to the destination device;

means for selecting each route processor of the network that is in the Layer 3 path and that appears on a Layer 2 path that is associated with the source device and the destination device and that leads to and emanates from the route processor;

means for selecting, for each selected route processor, a switch in the network that satisfies a pre-determined set of criteria as a relevant switch engine that multilayer switches the selected route processor;

means for creating and storing information that defines a multilayer switching path and that includes information identifying the source device, destination device, and each selected switch.

20. An apparatus for determining a multilayer switching path for a flow between a source device and a destination device in a switched network, the apparatus comprising:

a network interface that receives one or more messages from the network;

one or more processors coupled to the network interface to receive the messages therefrom;

a memory accessible to the one or more processors; and

one or more sequences of instructions stored in the memory which, when executed by the one or more processors, cause the one or more processors to carry out the steps of:

determining a Layer 3 path and a Layer 2 path through the network from the source device to the destination device;

selecting each route processor of the network that is in the Layer 3 path and that appears on a Layer 2 path that is associated with the source device and the destination device and that leads to and emanates from the route processor;

selecting, for each selected route processor, a switch in the network that satisfies a pre-determined set of criteria as a relevant switch engine that multilayer switches the selected route processor;

creating and storing information that defines a multilayer switching path and that includes information identifying the source device, destination device, and each selected switch.